The burden of malnutrition and fatal COVID-19: A global burden of disease analysis

Research snapshot[1]

The role played by population-level nutritional status in the vulnerability of countries to COVID-19 illness and death is unknown. Because childhood malnutrition is associated with high morbidity and mortality, mainly due to infectious diseases, it can be assumed that undernourished populations may be at greater risk of severe or fatal COVID-19 illness. This study aims to identify the countries where a high burden of malnutrition coincides with higher rates of fatal COVID-19 disease, indicating a potential relationship between these burdens. Analyses were conducted for 172 countries for which data were available on both COVID-19 case fatality ratios (CFR) and the country-level burden of malnutrition, quantified using death rates for child growth failure (underweight, stunting and/or wasting), years lived with disability (YLD) attributed to iron and vitamin A deficiencies and high body mass index (BMI).

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A child being assessed for malnutrition at a nutrition center in North Darfur, Sudan

There was no correlation between the rate of death for child growth failure and CFR for COVID-19. A slightly higher CFR for COVID-19 was seen in countries with very high rates of YLD for iron deficiencies. Countries' vulnerability to fatal COVID-19 was slightly higher with increasing rates of vitamin A deficiency, with no further increases for countries with very high rates of vitamin A deficiency. Vulnerability to fatal COVID-19 was slightly higher in countries with increased rates of high BMI compared to countries with low and median rates of high BMI. No correlations were seen between the rate of YLD for high BMI and CFR for COVID-19. Increasing rates of high BMI were, however, associated with a higher vulnerability to fatal COVID-19 in low-income countries.

Countries ranking high on at least three malnutrition indicators and with elevated CFR for COVID-19 are sub-Saharan African countries, namely, Angola, Burkina Faso, Chad, Liberia, Mali, Niger, Sudan and Tanzania as well as Yemen and Guyana. The authors conclude that population-level malnutrition appears to be related to increased rates of fatal COVID-19 in areas with an elevated burden of undernutrition such as countries in the Sahel strip.

[1] Mertens, E and Peñalvo, J L (2021) The burden of malnutrition and fatal COVID-19: A global burden of disease analysis. Front. Nutr. 7:619850. doi: 10.3389/fnut.2020.619850

Improving complementary feeding practices through smartphone-based maternal education in Iran

Research snapshot[1]

Mothers' poor nutrition-related knowledge, attitudes and practices are considered to be major causes of malnutrition in children, along with socio-economic and environmental factors. The growing ownership of smartphones offers a cost-effective platform to provide evidence-based health information and behavioural change interventions. Researchers assessed whether providing mothers with nutritional education through a smartphone application would have an effect on child undernutrition in a food-secure environment over a period of six months.

Children under three years of age with moderate or severe malnutrition ("wasting", defined by weight-for-height z-score (WHZ) <-2) and/or underweight (defined by weight-for-age z-score (WAZ) <-2) and/or stunting (defined by height-for-age z-score (HAZ) <-2) were recruited with their mothers in a well-child clinic in Urmia, Iran. The children and mothers were randomly assigned to either the intervention group (smartphone-based maternal nutrition education covering principles based on child age, child feeding behaviour, timing and appropriate introduction of complementary feeding and mothers' health) or the control group (routine health service treatment as usual which included the provision of standard nutrition information during regular check-ups).

Between baseline and endline, mothers in the intervention group showed greater and statistically significant improvement in the three indicators of nutrition literacy (critical knowledge, feeding attitudes and nutritional practice) compared to the women in the control group. Children in the intervention group showed greater positive change compared to the control group in their nutrition status: WHZ increased by +0.34 ± 0.26 ($p < .05$), WAZ increased by +0.35 ± 0.20 ($p<.05$) and HAZ increased by +0.34 ± 0.21 ($p<.05$). More children in the intervention group recovered from wasting (WHZ <-2) and underweight (WAZ <-2) than children in the control group ($p<.05$) while no statistically significant change was observed for stunting (HAZ<-2). At endline, 6% of the children were wasted in the intervention group compared with 32% in the control group.

The six-month smartphone-based maternal nutrition education programme on complementary feeding was more effective than standard routine nutrition information for correcting wasting and underweight among children under three years of age in middle-income food-secure communities. Although HAZ status improved, stunting rates did not which can be explained by the relatively short intervention period.

[1] Seyyedi, N, Rahimi, B, Eslamlou, H R F, Afshar, H L, Spreco, A and Timpka, T (2020) Smartphone-Based Maternal Education for the Complementary Feeding of Undernourished Children Under 3 Years of Age in Food-Secure Communities: Randomised Controlled Trial in Urmia, Iran. Nutrients, 12(2), 587. doi:10.3390/nu12020587